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February 12, 1863.

Major-General SABINE, President, in the Chair.

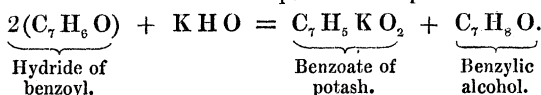
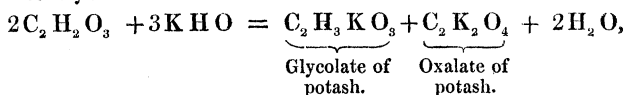
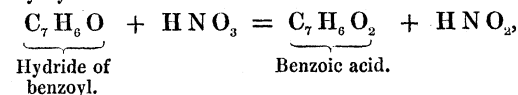
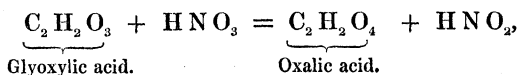
Pursuant to notice given at the last Meeting of the Society, His Royal Highness the Prince of Wales was proposed by the President for election and immediate Ballot. The Ballot having been taken, His Royal Highness was declared duly elected a Fellow of the Royal Society.

The following communications were read :—

- I. "On some Compounds and Derivatives of Glyoxylic Acid."
By HENRY DEBUS, Ph.D., F.R.S. Received December 31, 1862.

(Abstract.)

Glyoxylic acid contains one atom of oxygen less than oxalic acid, and may be considered as glycolic acid minus two atoms of hydrogen. It therefore bears to these two acids the same relation that oil of bitter almonds does to benzoic acid and benzylic alcohol. On another occasion* it has been shown to possess other properties in common with hydride of benzoyl. Dilute nitric acid, for instance, oxidizes glyoxylic acid to oxalic acid, and hydrate of potash converts it into glycolic acid and oxalic acid. The same reagents produce with oil of bitter almonds benzoic acid, benzoate of potash, and benzylic alcohol.



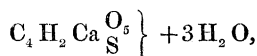
In the memoir of which this is an abstract certain properties of

* Quarterly Journal of the Chemical Society, xii. 234.

glyoxylic acid are described which still more intimately connect this body with the class of the aldehydes, so as to leave no doubt as to its position in the system of organic substances.

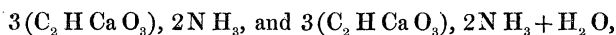
Glyoxylates and sulphites have a strong tendency to combine. Glyoxylic acid expels one-half only of the sulphurous acid from a given quantity of sulphite of soda, and forms the substance represented by the formula $\text{NaHSO}_3 + \text{C}_2\text{HNaO}_3$; an excess of sulphurous acid, on the other hand, expels one-half of the acid in glyoxylate of lime, producing $\text{CaHSO}_3 + \text{C}_2\text{HCaO}_3$. These salts crystallize well and are very stable.

Sulphuretted hydrogen and glyoxylate of lime exchange sulphur and oxygen, water and a new compound,



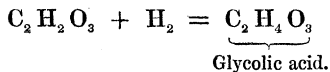
being the result. The sulphur acid in the latter salt seems to bear to glyoxylic acid a relation similar to that in which triacetic acid stands to acetic acid. Glyoxylic acid itself is decomposed by sulphuretted hydrogen, a new crystallizable acid being produced.

Ammonia forms definite compounds with glyoxylates. The following of them were investigated:—two bodies formed from NH_3 and glyoxylate of lime,



one silver and one lead compound. These derivatives are very unstable, but the products of their decomposition could not be obtained in a pure state.

Hydrogen *in statu nascendi* combines with glyoxylic acid and converts it into glycolic acid,



This transformation was brought about by dissolving zinc in dilute glyoxylic acid.

Glycolic acid, glyoxylic acid, and oxalic acid therefore possess, as regards composition and some other essential properties, the same connexion as ethylic alcohol, acetic aldehyde, and acetic acid. The differences between the two series arise from the greater number of oxygen-atoms in the molecules of the first three bodies.